



inps journal

Indiana Native Plant Society

Winter 2022-2023

Eastern Hemlock (*Tsuga canadensis*): Profile of an Indiana Glacial Relict

By Collin Hobbs

When it comes to trees, Indiana is most famous for its world-class deciduous hardwood forests. And rightfully so, as Indiana is the heart of the Central Hardwood Forest ecoregion. Unlike the mixed northern forests of the Great Lakes, or the Appalachian forests to the east and south,

Indiana's forests consist almost exclusively of deciduous tree species. Excepting the ubiquitous red cedar, most of Indiana's counties lack any native conifer populations. But here and there one can find tucked away in narrow valleys, clinging to precipitous sandstone cliffs, or blanketing steep north-facing slopes, stands of what might be the most beautiful of native conifers, the eastern hemlock.

Eastern hemlock (*Tsuga canadensis*) belongs to a genus containing ten species, six of which are found in Asia and four in North America. Of the



Collin Hobbs

The foliage of eastern hemlock consists of flattened sprays of blunt-tipped needles that bear delicate cones.

two eastern North American species, Carolina hemlock (*T. caroliniana*) is found only in a limited region of the Southern Appalachian Mountains. Eastern hemlock is more widely dispersed, growing from Nova Scotia to Minnesota and southward along the Appalachian Mountains to northern Alabama. In Pennsylvania the species has been designated as the state tree, the equivalent of Indiana's tulip poplar (*Liriodendron tulipifera*). Eastern hemlock has beautiful foliage

composed of dark green needles about 1/2" (12 mm) long arranged in a flattened plane along the twigs. Unlike pine, the needles attach individually to the twig rather than in clusters. The seed cones of hemlock are reminiscent of

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pinecones, only much smaller at a diminutive 1/2 to 3/4" (12 to 20 mm) in length. Besides making lovely specimen trees in the right setting (avoid dry, exposed areas, especially if the soil is alkaline), the dense foliage allows hemlocks to be trimmed into hedges.

Across much of its range hemlock serves as a forest climax species. It is slow growing and very shade tolerant, meaning that it can germinate and grow in the shade of itself and other trees. As noted on vPlants (see *Tsuga canadensis* on midwestherbaria.org) seedlings are often found growing on rotting logs and moss-covered rocks. Individual plants can persist for 50-100 years in the shaded forest understory until an opening allows them to reach into the canopy where they can continue to thrive for centuries. In forests where hemlock dominates, the accumulation of its fallen needles and twigs acidifies the soil. This, in

Hemlock — continued on page 2

Hemlock — continued from front page

combination with the tree's dense shade and absorption of soil moisture, discourages most plants from growing beneath it.

With time mature hemlocks can reach massive proportions. Eastern hemlock holds the record for largest tree by volume east of the Mississippi and, depending on who

you ask, the second tallest (after white pine) with the current record holder at 175 ft or 53 m (see the 2021 National Register of Champion Trees). Most of these giant hemlocks are found in the Smoky Mountains and almost all of them have, sadly, died within the last twenty years because of infestations by hemlock woolly adelgid.

Indiana is situated on the fringe of hemlock's geographic

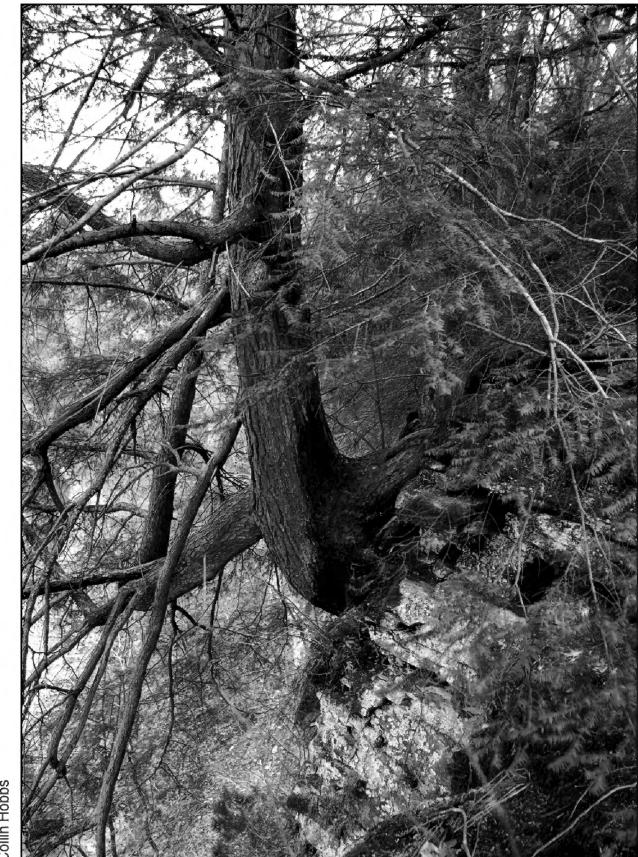
range. Charles Deam noted in his 1940 *Flora of Indiana* that our hemlocks are found in small, well-defined populations in parts of southern Indiana. The work of John Potzger, another Indiana botanist (see INPS Journal, Fall 2022), demonstrated that Indiana once had extensive coniferous forests shortly after glaciers receded northward about 12,000 years ago. This has led botanists to propose that Indiana's hemlocks are glacial relicts, hanging on as isolated "islands" surrounded by a sea of deciduous trees.

While that hypothesis makes sense it is not the only explanation for Indiana's hemlock "islands". Our region went through a rather warm, dry period about 8000 years ago known as the hypsithermal, and this may have driven moisture sensitive hemlocks to extinction locally. Since that time, long-distance dispersal of hemlock seeds from the species' main range may account for the small, scattered populations in our state. In recent years new genetic tools have made it possible to revisit these competing hypotheses. In my research (Hobbs & Clay 2013, Hobbs 2013), I investigated the genetic diversity of Indiana's hemlock populations and compared them against populations from the main distribution in the Appalachians and Great Lakes regions. After analyzing the genetic resources of 470 trees from 24 different populations, I concluded that the patterns of genetic diversity best fit the relict population hypothesis. These populations are survivors, not recent invaders!

Unfortunately, our survivor of ancient forests now faces a modern threat in the form of a non-native insect. The hemlock woolly adelgid (*Adelges tsugae*) is a tiny aphid-like insect covered with white, cottony fluff. It is native to Asia, where it is a minor sap-sucking pest of Asian hemlock species, kept in check by natural predators and the adaptive defenses of its host trees. However, both eastern and Carolina hemlock are highly susceptible to it. It was introduced accidentally in Virginia in the 1950s, and has since spread north to Maine, south to Alabama, and westward to Kentucky and Ohio. The health of infected hemlock trees slowly declines, typically leading to death within 4-10 years. Mortality rates, especially in the warmer Appalachian region, can exceed 99% within a decade (Ellison et al. 2018).

The isolation of Indiana's populations has, so far, protected them from this devastating pest. The Indiana Department of Natural Resources has one report of the insect from 2012 in LaPorte County. Fortunately, this occurrence involved a cultivated specimen that likely originated from infected plant nursery stock. It was quickly recognized by the homeowner, treated with insecticide, and no other occurrences were observed nearby.

— continued at right



Collin Hobbs

In Indiana, eastern hemlock often hugs the face and upper edges of sandstone cliffs.

Ellen Jacquart Wins NAA Stewardship Award

The bullet may have been dodged ... for now! Although the isolation of Indiana's hemlock stands provides some protection, it may only be a matter of time before the adelgid arrives at a native population, either by hitchhiking a ride on birds or from infected nursery stock imported to our state. Some of Indiana's most treasured natural areas, such as Shades (Montgomery, Parke, and Fountain Counties) and Turkey Run State Parks (Parke County), Green's Bluff (Owen County), Hemlock Cliffs (Crawford County), and Trevlac Bluff (Brown County), would not be the same without hemlock trees. Chemical treatment of these forest patches would be difficult and biological control agents have, to date, shown only mixed results (NYDEC 2022).

Our story about eastern hemlock provides two "take-aways." First, make a goal to visit our relict populations of eastern hemlock. They enhance some of Indiana's most breathtaking natural areas and in winter these evergreens are easy to spot. Second, monitor hemlock trees and nursery stock in your own area, watching for tiny insects covered with white fluff. Report suspicious plants to the IDNR. You will do all lovers of native plants a huge favor.

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Collin Hobbs is an Associate Professor of Biology and Curator of the Fred Loew Herbarium at Huntington University. A native of Wisconsin, Collin earned a PhD at Indiana University and has since put down roots in his new home state. He is a member of the Northeast Chapter of the INPS.

The Natural Areas Association (NAA) has announced its award recipients who demonstrate the highest standards of leadership and achievement in the natural area profession. Our own Ellen Jacquart is the 2022 winner of their Carl N. Becker Stewardship Award, which recognizes excellence and achievement in managing the natural resources of reserves, parks, wilderness, and other protected areas.

Ellen Jacquart, president of the Indiana Native Plant Society, recently retired after an impressive 40-year natural areas preservation and management career.

Early in her career, Jacquart spearheaded the creation of the Central Indiana Land Trust in 1990, which has protected more than 6,500 acres of natural areas.

Additionally, at a time when there wasn't a source for certain species of native plants for restoration projects at the Hoosier National Forest, Jacquart led efforts to create a native plant nursery, and seeds from that project continue to support Indiana's natural areas today.

The Natural Areas Association serves scientists and practitioners focused on the management of ecologically significant natural landscapes with the intent to protect biodiversity for current and future generations. Protecting nature requires quality science to inform practices on-the-ground and access to reliable resources that can advance the conservation and stewardship of land and water biodiversity. NAA curates and shares relevant and timely programs and resources with practitioners responsible for the ecological resilience and protection of natural areas in perpetuity.

We are proud that Ellen has been recognized for her outstanding contributions to the field. 



Ellen Jacquart

Kip May

Native Conifers in

Notes from the Mad Botanist

[Editor's Note: This current issue of INPS Journal includes book reviews on Indiana trees, experiencing our forests, and a feature article on eastern hemlock. It, therefore, seemed appropriate to further highlight a particular segment of Indiana's native flora, its 11 conifer species. Some of these species already are enjoyed in our home landscapes either as wild types, nativars, or even horticultural hybrids. Some are unfortunately ignored. Some should be avoided, either because of the challenge of growing them or because their characteristics make them problematic. I asked my friend, the Mad Botanist, to weigh-in with his thoughts, and here is what I learned. I hope you find it useful in your landscape decisions.]

Preamble: First, a basic rule of garden design when choosing and placing woody plants – all woody plants are indeterminate in growth. There is no mature size (i.e., all trees, shrubs, and woody vines only stop growing when dormant or dead). So, visualize the future and give them adequate space.

Pinus strobus – I love white pine but I would never use the “straight” species unless sited on multiple acres. I have 3-acres and do not have it. It gets too big, too fast, and is prone to ice and snow damage. Pendula weeping white pine (I have three) is a spectacular plant, every specimen is different. You might try other weeping forms as well.

Juniperus horizontalis – Historically, creeping juniper occurred in our Lake Michigan area. It likes well drained sunny locations. The Blue Rug cultivar can create a ground cover at least 6 ft (2 m) in diameter.

Juniperus virginiana – Eastern red-cedar counts as one of my fav plants – very tolerant of poor soil, stunning in old age, long lived. There is an interesting weeping cultivar Pendula which is best if trained upward for a few years. Grey Owl is another stunning blue horticultural cultivar. For the native plant purest, be aware that Grey Owl is only about 1/3 *J. virginiana* since it is the product of a *virginiana* × *pfitzeriana* cross (and *J. pfitzeriana* is itself a hybrid). Watch for more excellent offerings in the future since wild populations, increasingly abundant in the Midwest, exhibit all sorts of variation.

Larix laricina – American larch (aka tamarack) is an excellent, underutilized species that gets big and gets big quickly. I love the soft foliage and its variable color – delicate green to almost blue – and awesome fall color. Did I say that the cones are cute? Although rarely offered elsewhere, Woody Warehouse in Lizton (W of Indy) has it.

Pinus banksiana – Wild type Jack pine is okay, but rarely available. Look for these awesome cultivars: Schoodic, a low-growing horizontal form, and the to die for pendulous form Uncle Foggy.

See how many of these native conifers you can identify!
The answers are on page 9.

all photos by Paul Rothrock



the Home Landscape

Juniperus communis – Common juniper is almost never offered and not recommended; enjoy in the wild.

Pinus virginiana – Virginia pine counts as another of my favs, although rarely offered by nurseries. I love the asymmetric growth form and it is the perfect fit for suburban sites with poor soil. There are only a few variants available, most notably Wate's Golden. As with many woody plants the prime enticing difference (in Wate's this feature is the early yellow growth) becomes less obvious as they age.

Taxodium distichum – I love bald cypress, but it has several problems for homeowners (especially size and those knees). That said, the cultivar Peve Minaret is a stunning dwarf, I have three; there is also a super dwarf Cave Hill and a couple of interesting dwarf weeping cultivars. It must be understood, however, that dwarf simply means less tall than the parent. In the wild I have seen individuals that are 100 ft (30 m) tall and 8 ft (2.5 m) in diameter. The mature size posted on websites for Peve Minaret is wrong; probably more like 40 ft. I think a forest of them would be interesting.

Taxus canadensis – American yew is almost never offered and not recommended. Deer will ravage it. Seek to protect boreal relic habitat so that we may continue to enjoy this lovely conifer in the wild.

Thuja occidentalis – Aside from one population in the Indiana Dunes, natural populations of northern white cedar are likely extirpated from Indiana. The plant can get big: the world record specimen, which I saw on South Manitou Island in northern Lake Michigan, fell a few years ago. Its trunk was over 5 ft (1.5 m) in diameter. It is important to understand that this is a swamp plant. It cannot tolerate dry conditions until it is established, which is several years after planting. For this reason, most people kill new plants. There are several boring cultivars, but the skinny versions, such as Thin Man and DeGroot's Spire, are quite nice. These are as close as we can get to having the Italian cypress look.

Tsuga canadensis – Eastern hemlock is a beautiful plant (leaves, form, and cones) but unfortunately needs to be avoided due to woolly adelgid. Since it gets huge do not be an idiot and nestle your planting up against the house. If I were getting one it would be a dwarf cultivar. Beaujean is spectacular! The white tipped cultivar is cute when young. Sargent's weeping hemlock, discovered in the 1850s, is still considered one of the world's great cultivars.

The Mad Botanist resides in Indianapolis and cultivates 18 genera and 108 species, varieties, and cultivars of conifers in his home landscape. For his sharp, deeply-versed botanical blogs visit themadbotanist.com.



And the Winner Is – Pawpaw, Native Plant of the Year

Top: In early spring pawpaw produces flowers with, as described by one botanist, a lurid purple color.

Bottom: The large leaves of a pawpaw patch turn bright yellow in autumn.



At the October 22nd INPS Annual Conference, Mike Homoya announced that pawpaw (*Asimina triloba*) won the honors as Native Plant for 2023. The 2022 winner was the herb butterfly milkweed (*Asclepias tuberosa*), a lovely garden perennial as well as food plant for monarch butterflies. The equally praiseworthy pawpaw provides an example of a native tree species with a reputation in the popular imagination as well as an edible fruit sought after by many animal species as well as us humans. You can learn more about pawpaw by referring back to a feature article in the autumn issue of the *INPS Journal*. By the way, the Journal editor, Paul Rothrock, hopes that he did not bias this year's native plant selection by highlighting it in a recent issue. Regardless of that potential bias, pawpaw will provide excellent talking points for INPS membership in 2023 as you talk-up the beauty and ecological importance of our native species. And, of course, grow some.

Charles Deam's 1932 *Trees of Indiana* nicely summarized the attributes of the species:

"Recently some enthusiasts have christened pawpaw the 'hoosier banana.' There has been an attempt for years to cultivate it, and some varieties have been named.... Pawpaw is desirable for ornamental planting on account of its interesting foliage, beautiful and unique flowers, and delicious fruit. [But be aware that ...] some individuals after eating the fruit develop a rash with intense itching.... It is very difficult to transplant a root sucker plant, and in order to get a start of this species it is best to plant the seed or seedlings. It prefers moist, rich soil and is usually found growing in the shade, but does well in full sunlight.... The tree is free from all insect enemies, and since it can be grown in 'waste places,' there is no reason why it should not receive more attention than it does."

Paul Rothrock



Indiana Maple Syrup

By Kevin Hart

When our European ancestors came to Indiana, the state was nearly completely forested, and Native American families turned maple sap into cakes of maple sugar for consumption and trade. Indigenous peoples revered maple sugar and syrup as natural sweeteners.

European settlers modified indigenous methods of harvesting and processing. By 1840, the state became the country's fourth largest producer of maple sweeteners, producing the equivalent of 5.6 million gallons of syrup. This is four times larger than that of today's top-producing state Vermont. However, maple syrup production declined with Indiana's forest cover. By 1940, Indiana was only producing 51,000 gallons of maple syrup.

For the past 30 years, however, a new crop of maple syrup producers has started tapping trees. Supply is steadily increasing, often up 20% year over year, and new technologies are playing a role in production efficiencies. Today the Indiana Maple Syrup Association has approximately 200 producer members with operations ranging from 10,000+ taps to just a couple taps in the backyard. Although Sugar Camps are scattered around the state, most are north of the I-70 corridor.

Making maple syrup is a simple process, but it is a process. To tap a tree, one hand drills a 5/16" hole 1 1/2 to 3" into the tree. Only tap trees that are at least 10" in diameter at breast height. Tap the spile into the hole, set or hang a bucket to catch the sap. Sap should be collected daily and boiled as soon as possible because it spoils quickly, especially in warm temperatures.

The boiling of the sap requires a check on the boiling point of water. It varies with barometric pressure. You boil the sap at 7 1/2 °F above its boiling point. This should be done outdoors or in a dedicated sugarhouse since the sap emits large volumes of steam. There are numerous horror stories from those who have attempted to do this in the kitchen – peeling wallpaper, warped cabinets, or mold growth months later.

When proper temperature is achieved the syrup will need to be filtered and canned or bottled while hot. Filtering through thick flannel or felt will help remove the sugar sand, a mineral occurring naturally in sap. Once properly bottled, the syrup

is self-stable. It only needs to be refrigerated once the seal is broken.

My own sugar mapling operation, Maplewood Farms LLC, is located in the headwaters of Brookville Reservoir, near Brownsville. Although the farm has been in the family for four generations, it only turned into a tree farm after my wife Lisa and I purchased the farm from the family in 2000. Maple syrup production was purely an accident, something we had not considered until a consulting forester suggested it. After we "earned a degree" from YouTube and Google University and joined the Indiana Maple Syrup Association, we began tapping trees in 2013. Our Camp, with about 110 acres, has approximately 2500 taps. We operate a 3-foot by 8-foot combination flue evaporator. Wood fired. We use tubing to connect all the trees to the lowest point on the farm. This system is on vacuum, which increases sap flow. Through reverse osmosis in the sugar house, the sugar content of the sap is increased from around 2% to 6 to 8% before we boil it. By removing about 75% of the water from the sap, the processing is faster and uses less fuel.

If you want to see this in action, come join a Sugar Camp! On the second weekend in March, maple syrup producers across the state open the doors to their "sugar shacks" for the fun-filled Indiana Maple Syrup Weekend. Join your fellow Hoosiers as they process maple sap into syrup and other delicious products. Tour the maple stands, taste warm syrup just off the fire, make maple candy, and learn about the state's proud maple-producing traditions. Visit [www.indianamapleweekend.com](http://indianamapleweekend.com) for more information. In the process you will discover that maple syrup production uses native plants sustainably, supports habitat important for migratory birds, and provides a healthier natural sweetener, all while boosting our local farm economy.

And, as always, thank you for supporting our Habit-Taps!

Kevin Hart is President of the Indiana Maple Syrup Association and markets his products directly to the consumer at the Broad Ripple farmer's market (where he met INPS member Ruth Ann Ingraham) and the Carmel farmer's market. See his website at [www.indymaplesyrup.com](http://indymaplesyrup.com).



Visit the Indiana Maple Syrup Association's website at indianamaplesyrup.org to learn more about all things maple syrup, including about the Indiana Maple Syrup Project (see above graphic), a 2021-2024 project to increase production and consumption of maple syrup by promoting its benefits to human health, local economy, and forest ecosystems.

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To promote the appreciation, preservation, scientific study, and use of plants native to Indiana.

To teach people about their beauty, diversity, and importance to our environment.

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Granola:

A Recipe that Includes Native Plant Ingredients*

**Prepared by
Ruth Ann Ingraham in her
Broad Ripple kitchen**

Ingredients:

- 4 C. old fashioned oats
- 1 C. pepitas (pumpkin seeds)
- 1 C. almonds - chopped
- 1 1/4 C. pecans - chopped*
- 1 C. dried, shaved coconut - unsweetened
- 1/2 C. maple syrup*
- 1/2 C. olive oil
- 1/3 C. brown sugar
- 1 tsp. salt

Directions:

1. Toss together oats, pepitas, almonds, pecans, and coconut in a large bowl.
2. Stir together maple syrup, olive oil, brown sugar, and salt.
3. Pour liquid mixture over dry ingredients and mix well.
4. Spread evenly in a shallow layer on a large baking sheet or sheet cake pan.
5. Bake at 350 degrees. Stir every 10-15 minutes until an even, light brown – around 30-40 minutes.
6. Cool completely and store in tightly lidded containers.

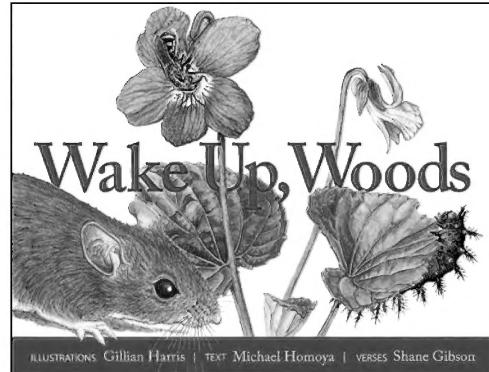
* Denotes native plant ingredient.

Ruth Ann Ingraham is a founding member of INPS and a part of the Central Chapter.

Answers to confirm quiz from page 4:
A. common juniper (*Juniperus communis*)
B. red cedar (*Juniperus virginiana*)
C. American larch (*Larix laricina*)
D. bald cypress (*Taxodium distichum*)

Wake Up, Woods!

A reminder: before the spring ephemerals pop from their winter sleep, pick up a copy of the award-winning book *Wake Up, Woods*. And, be sure your friends and family, young and old and in between, have their own copies. They will love the breath-taking botanical illustrations of Indiana springtime flora and pollinators as well as scientific information and charming poetry. *Wake Up, Woods*, created in 2019 by the Indiana Native Plant Society, may be purchased in many locations including Kids Ink Children's Bookstore in Indianapolis, state park gift shops, the Indiana State Museum, and online.



ILLUSTRATIONS Gillian Harris | TEXT Michael Homoya | VERSES Shane Gibson

Florathon 2023

Florathon is an annual INPS event aimed at enjoying spring wildflowers, supporting a worthy cause, and building plant identification skills. Each chapter is encouraged to form at least one team of 2-6 people who will spend a 24-hour period identifying, in the wild, as many species as possible. The dates of the 2023 competition are **April 17-May 31**.

Each team should solicit sponsors to contribute either on a per species basis or a flat sum. News flash – this year local chapters may opt for a portion of the proceeds for their own local projects. Also, in forming teams, it is recommended that a beginner member be connected with more experienced identifiers. For full information about Florathon visit <https://indiananativeplants.org/inps-sponsored-events/florathon>.

The 2022 Tour: In Harmony with Nature – Treasures of Southwest Indiana

Top: Blue-eyed Mary is a winter annual that thrives in moist, rich soils of alluvial bottoms and stream terraces.

Center: Twin Swamps Nature Preserve is among the northernmost stations for bald cypress (*Taxodium distichum*).

Bottom: The Bluffs of Beaver Bend, located in Martin County, is known for its rich fern and moss flora. It also harbors almost 60 species of trees and shrubs plus an abundance of spring ephemerals.



Mark Zelonis



By Mark Zelonis

Do the short days of January and the winter issue of INPS Journal create in you an itch for spring? If so this is a perfect time to reminisce about the spring past and feed your dreams for the spring yet to come.

April 2022 beckoned a group of 27 of your fellow native plant lovers (ranging in age from 30's to 80's) on a three-day tour of botanical hotspots in southwest Indiana and nearby Illinois. I provided the logistics for the tour and the amazing Mike Homoya supplied the botanical depth. The ever-enthusiastic Ruth Ann Ingraham took on the role of tour promoter.

From the initial stop at McCormick's Creek to the final one at Bluffs of Beaver Bend near Shoals, we all experienced a perfect blend of springtime flora punctuated by fauna moments, fun and camaraderie, and good food.

Picking a favorite sight or experience proves a challenge. Garden of the Gods in Herod, Illinois and the Bluffs of Beaver Bend were clearly top on the list; one participant called them a "total surprise." The former is arguably the most photographed spot in Illinois while the latter has a mile long sandstone bluff with its secluded fern-rich trails. But who wouldn't love Twin Swamps in Posey County where Mike Homoya proposed to Barb years ago?

With so much plant diversity, choosing a favorite flower is like picking a favorite child. With that in mind, though, blue-eyed Mary (*Collinsia verna*) and merrybells (*Uvularia grandiflora*) scored high. As for dining spots, lunch at The Red Onion in Equality, Illinois got the prize.

Animals and history also had a role in our tour-experience. Barb Homoya discovered a marbled salamander (*Ambystoma opacum*) at Twin Swamps. Others wanted to go back to the Audubon Museum and spend more time with the complete set of John J. Audubon's *Birds of America* as well as artifacts from his Kentucky years.

I am gathering ideas for a 2023 tour – either northeast Indiana (the planned itinerary before COVID hit) or the Dunes region in northwest Indiana. Let's dream together about the spring to come and all its possibilities!

Mark Zelonis, a member of INPS Central Chapter, runs Cultural Excursions, a small company he launched after retiring from the Indiana Museum of Art.

Springtime in the Smokies

By Tom Hohman

Many of us look forward to that first gentle snow of winter, transforming Indiana woods and neighborhoods into a lovely winter scene. Even the second light dusting is enjoyed by many. However, after that 5th or 6th time spent clearing the walks, or that travel-disrupting 8-10" snowfall, most Hoosiers are longing for spring. We look forward to the prospect of seeing those first spring wildflowers in our local parks or nature preserve, or maybe in our own wildflower garden. For the past 20 years I have had another rite of spring – the annual Spring Wildflower Pilgrimage in Great Smoky Mountains National Park.

The first Pilgrimage was held in 1951, and they quickly grew in popularity until attendance was averaging about 800-900. Indiana typically sends a large number of "pilgrims," ranking in the top ten among states for attendance. Yet the event is still surprisingly unknown by most in Indiana.

If you have never been to the Smokies before you are in for a treat. The area is known for its astounding diversity and amazing spring wildflowers. Spring ephemerals that are common in Indiana, such as spring beauty (*Claytonia virginica*), cut leaf toothwort (*Cardamine concatenata*), and yellow trout lily (*Erythronium americanum*), are found there. But there is much more. The Smokies are well known for the many varieties of gorgeous trilliums (*Trillium spp.*), pink and yellow ladyslippers (*Cypripedium acaule* and *C. parviflorum* var. *pubescens*), showy orchis (*Galearis spectabilis*), and many more that are uncommon or not present in Indiana. Although many (but not all) of the tree species are found in Indiana, the Smokies just seems to grow them bigger.

The Pilgrimage is a mixture of physically challenging hikes, learning, and enjoyment of nature, with the exact mix up to each individual. I like the Ramsey Cascades or Abrams Falls trails, which are moderate to strenuous, 5-8 mile long hikes, ending at back country waterfalls or scenic overlooks. Others may prefer leisurely strolls on paved paths near the park visitor center. While these are the extremes, there are many options for short to medium length hikes featuring waterfalls, massive spring wildflower displays, and old-growth trees.

For those wanting to broaden their experiences, there are options for birding hikes and

programs on varied topics, from black bears to salamanders. Even the non-hiker is not left out, with programs on topics such as photography, journal keeping, and park history. In all, a typical year has 140-150 hikes and programs to choose from over the four days of the event.

While time spent in the Smokies in the spring is a treat by itself, the bonus is that all hikes are led by knowledgeable guides. Some are botany professors and grad students, as well as park naturalists or private botanists. To add a touch of home, some are even from Indiana. Your hike leader just might end up being Mike Homoya, Roger Hedge, Karen LaMere, or Fritz Nerding, all familiar to many INPS members.

The dates of the Pilgrimage vary from year to year, but are always in the second half of April. The 2023 event will be April 26-29 (Wednesday through Saturday). Registration will open on March 1. Once the hikes are posted on the website, <https://www.wildflowerpilgrimage.org/>, you can look over the options and plan your schedule (with backups). Prepare to register on opening day, as early as possible. Popular hikes fill early, and are often closed by noon of the first day. And don't forget to book a hotel. While Gatlinburg has lots of hotel space, there are sometimes other events occurring at the same time, leading some hotels to fill quickly.

Those who like the concept of wildflower pilgrimage, but cannot make it to the Smokies, should check out our Indiana version -- the annual Spring Wildflower Foray in Brown and Monroe Counties. This late April event marked its 37th year in 2022. As with the Smoky Mountain Pilgrimage, there are a wide variety of hikes and programs to meet everyone's needs. Information can be found at <https://www.browncounty.com/wildflower-foray/>.

Tom Hohman is a member of the Central Chapter of INPS and a past president. He also is the current president of Indiana Parks Alliance.

Catesby's trillium (*Trillium catesbeiae*), a southeastern US endemic species, has distinctive long, curved sepals and stamens.



Tom Hohman

John Bacone, retired Director of Indiana Division of Nature Preserves, accompanies Tom Hohman on the annual Pilgrimage. Here John shows off a clump of the southern Appalachian yellow trillium (*Trillium luteum*).

Book Review: “Magnificent Trees of Indiana” by Carroll D. Ritter

Swamp white oak
in Kramer Woods,
Spencer County.



Carroll Ritter



Catalpa grove in
Harrison County.

Reviewed by Kay Yatskievych

Magnificent indeed! This new large format book ($9\frac{1}{4}'' \times 12\frac{1}{4}''$) from Purdue University Press has over 200 amazing photos. These include images of 74 featured trees, 20 of Indiana's old-growth forests, historical images, and other related subjects. Many of the trees have full-page photos that are superb, but there are also excellent smaller photos.

The book is not intended to be an identification guide; that is for other references to handle. Instead, it documents forests and big trees from all over the state and is intended to show as many state record champion trees as possible. Many of the trees were listed on the Indiana Big Trees Register (2015), but Ritter in the process of doing research for this book has nominated seven new record trees for the upcoming version of the Register. Some of the featured trees are species included on Indiana's 2022 Endangered, Threatened, and Extirpated List.

In addition to the marvelous photos, the writing is a delight. Each of the 74 featured trees (pp. 18–170) have interesting essays written in an engaging style. Each also includes bullet point summaries of

reader to revisit the locations and see these breath-taking organisms for themselves.

The book covers the historical aspects of settlers moving into Indiana. In 1872 Robert Ridgway wrote in his renowned “Notes on the Vegetation of the Lower Wabash Valley” that Indiana had “the finest broadleaved hardwood forest anywhere in the world.” And sycamores 150 to 200 feet tall were common and reached to 30 feet in diameter. Several short chapters highlight our changing relationship with forests and the range of forest types currently seen in the state.

Chapter 5 provides a highly informative portion of the book – the “magnificent 20,” i.e., a reprise of 20 of Indiana’s remaining primary old-growth forests. Each has either a full-page photo or several smaller photos and excellent text about these wonderful areas. It provides their location and whether they are available for public visitation.

In addition to the 74 tree species and the 20 old-growth forests, Chapter 6, “The Odd and the Curious,” has incredible photos and some comments on oddities and hybrids. This is followed by the aptly named “Sheer Beauty” (Chapter 7), with numerous beautiful photos.

The index is the one fault I find with Ritter’s volume. Unfortunately, it does not have entries for scientific names, so users who know a tree only by its scientific name will have difficulty locating the entry for it. In addition, the vernacular names are alphabetized only by the modifier part of the name (e.g., northern red oak) but an entry for the main name followed by the modifier (oak, northern red) is not included. Another problem is that images of oddities and trees of sheer beauty (pp. 219–237) lack index entries.

Despite the problems with the index, this is a wonderful book about Indiana woody flora, one that you can enjoy reading and viewing in your leisure. It should become a valued addition to the book collections of anyone interested in Indiana’s glorious outdoors and its plants.

Kay Yatskievych is the author of the Field Guide to Indiana Wildflowers (2000). Kay’s checklist of Brown County and Monroe County (now in its 40th year) was the impetus for the Annual Wildflower Foray which just had its 37th year.

“Characteristics” and “Uses.” The author includes the location of many of the trees featured in the book and in the Big Trees Register, which makes it possible for the

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Mitchell's Satyr—continued from back cover

hybrid communities since they possess a rich association of plants with prairie, bog, and sedge meadow affinities all growing together. Many of the plants are calciphiles found there because of the high lime content of the groundwaters that have percolated through calcareous, glacially deposited gravels. These plant communities tend to have high numbers of conservative species, many of them rare, threatened or endangered (RTE). Animal associations, especially insects, include many conservative and/or RTE species as well.

The number of conservative lepidopterans that live in fens is remarkable. An extremely beautiful one that is easy to identify is the Baltimore checkerspot (*Euphydryas phaeton*). Although uncommon, it can be found in many fens (as well as some other wetland types). Many of you have likely seen it and marveled at its beauty. On the other end of the spectrum, though, is the Mitchell's satyr (*Neonympha mitchellii*) which is so rare that it is federally listed as endangered. Known populations in northern Indiana and southern Michigan have been declining for many years. Although there may be other undiscovered populations, Indiana currently has only one known population.

Appearance-wise, Mitchell's satyr is very small and plain. The upper side of its wings are just plain brown. However, the underside of each wing has a row of four or five black spots ringed in yellow, and dotted with tiny silvery markings. The black spots are surrounded by two orangish bands. Fortunately, when Mitchell's satyr is perched, the wings are almost always folded to expose their prettier underside. Is it beautiful? Perhaps not. Yet, it does have a subtle beauty that may be emotionally enhanced in our minds by its rarity. For me this loveliness is enhanced by living in a globally rare natural community associated with dozens of other conservative species. I call it "beauty by association." Thus, caring about Mitchell's satyr is caring about fens.

Unfortunately, few people will ever encounter a Mitchell's satyr. Few will have the feeling that comes with seeing first-hand that tiny brown waif bobbing through the sedges. And sadly, due to its rarity, there is the possibility that Mitchell's satyr will not survive in Indiana or elsewhere. In spite of that, we seek to preserve and protect fens and

their amazing diversity. Beyond that, we need to grow in our understanding of the goodness of natural diversity and how it enhances the functionality of our biosphere. Life as we know it depends on it.

Epilogue 2022

When I originally wrote this article in 2020, I mentioned that plants and animals are disappearing rapidly as a result of human actions, and then posed the question "Does it matter?" to which I responded "Probably." I am herewith changing my response: Of course, it matters. It's a topic I plan to explore in more detail in future issues of the INPS Journal.

For now, let me end with a short tribute to E.O. Wilson, who passed away a little over a year ago on December 26, 2021 at the age of 92. Edward Osborne Wilson (1929-2021) was a professor at Harvard University for 46 years and one of the best known and most influential scientists of his time. He has been variously described as a biologist, naturalist, ecologist, entomologist, and conservationist. He is perhaps most well known as an entomologist specializing in ants, but his knowledge and expertise in all facets of biology went well beyond ants.

Wilson's ideas and conclusions related to evolution, sociobiology, and other related topics were well-known and both praised and panned by many. He was a prolific writer of scientific papers and books (30+). His award-winning books were written in a style understandable to the masses, thus bringing their message to audiences previously unreached by the scientific community. Most notable was his leadership over the past 50 years promoting the preservation of biodiversity. His message lives on.

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Lee Casebere, a member of the Central Chapter of INPS, is a naturalist, ecologist, nature photographer, and retired assistant director of IDNR's Division of Nature Preserves. He is a somewhat frequent contributor to this Journal.

Book Review:

“Forest Walking”

by Peter Wohlleben and Jane Billinghamurst

Reviewed by Paul Rothrock

If *Magnificent Trees of Indiana* by Carroll Ritter (2022, Purdue University Press) sparks excitement about Indiana forests, then *Forest Walking: Discovering the Trees and Woodlands of North America* (2022, Greystone Books) will fan the flame. Peter Wohlleben and Jane Billinghamurst make for an effective team in bringing alive the forest world and individual tree species that inhabit it. Wohlleben provides technical forestry expertise and his frustration with those who would reduce a forest to a mere cropland known as a tree plantation. He has considerable fame for his book *The Hidden Life of Trees*. Billinghamurst brings a personal touch that comes from her travels throughout the U.S. visiting noteworthy forests and trees and talking with those who try to think holistically about them.

Chapter 1 immediately takes you into the forest – a shaded, cooler, moister world. I was surprised, though, by the attention to sound, not the first thing a forest brings to my mind. Perhaps because I focus on the quiet and solitude that a forest may afford. While *relative* quiet is true, the “leaves and needles whisper and sing.” In winter the dry beech leaves chatter while still attached to their twigs. Aspens provide a muffled muttering. And then there are conifers producing *matsukase*, the “song of the pines” that varies in pitch as breezes build and die. Given my recent move to a part of the country where conifers abound, I am anxious to listen for these less familiar sounds.

Forest wisdom gently wafts from the pages of this book as the authors first draw our attention to specific parts of the tree, beginning with the roots. They take the opportunity to impart an understanding of forest trail etiquette sometimes embodied in the signage that a plant “grows by the inch but dies by the foot.” Likely you have been awed by individual trees, such as those depicted in *Magnificent Trees of Indiana*. The awe emerges, in part, from the scars that testify “to all the tree has endured during its long life. These scars reveal that a tree is resilient and determined to find a way to continue growing, as straight and tall as it can, toward

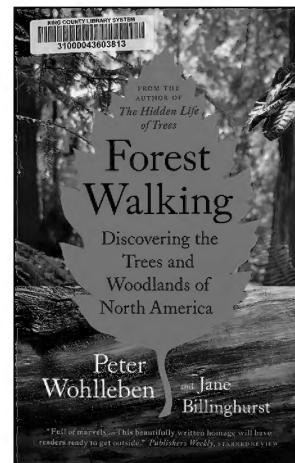
the light.”

After chapters on tree trunks, bark, and leaves, nuts, and seeds, attention turns to the broader forest environment. There are chapters on decomposers, fascinating symbioses, the beauty of small things, and the forest at night and in different seasons. Did you know that leaves sleep at night or that mosses harbor curious creatures called tardigrades, also known as water bears? On your next winter walk keep an eye out for hair ice. To enhance your forest experience, whatever the season, read the chapters dealing with spotting wildlife and choosing your wardrobe.

Because I am the grandparent of an eight year old, the two chapters on how to engage children with the forest are particularly welcomed. Their fun suggestions aim at experiencing the tastes, smells, and sounds of the forest. The sounds include your own music making with leaf instruments or willow flutes. A sharp pen knife is the only tool you need for making your springtime flute.

The book is written in a casual style that the reader should find accessible. The one oddity is that the co-author Jane Billinghamurst, who did the U.S. travel for the book, gets quoted at times in the third person – a bit awkward. Some might also complain about the depth of coverage for any particular topic. In this regard, the authors admit that they are providing an “appetizer” and not the full meal. Their ten pages of endnotes and a bibliography with 27 entries can lead the reader deeper. Nevertheless, additional web research and books are not needed to absorb the overall intent of *Forest Walking* – to engender a personal conservation ethic through the simple act of learning about the amazing experiences that await in these wild places. *Forest Walking* is an enjoyable read. It should precede your next venture into our Indiana forests and, in fact, it likely will goad you to get out and see them firsthand!

Paul Rothrock, until recently a member of the South Central Chapter of INPS, now is learning the trees of Washington state and the flora of Bellevue Botanical Gardens. He continues to serve as content-editor of the INPS Journal.





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Why Should We Care About the Mitchell's Satyr?

By Lee Casebere

[A version of this article appeared in the first issue (June 2020) of the newsletter "The Lonely Satyr: For Butterfly Enthusiasts of Northeast Indiana," edited by Leslie Arnold, naturalist with LaGrange County Parks and Recreation.]

Let me try by beginning with a shock value approach. I remember seeing a film about biodiversity years ago in which botanist Hugh Iltis from the University of Wisconsin was discussing the value of preserving certain plants with unknown qualities. He said that in discussing this topic someone frequently asks, "well, what good is it?" – to which he responds by asking "what good are you"? To many, his retort is viewed as caustic, insensitive, and offensive. But we must admit that the human community is deeply imbued with arrogance. We're often quite certain of our own importance, and question the importance of things we know little about. Our propensity to ask "what good is it?" shows our willingness to categorize many living things into "keepers" and "non-keepers" with little or no knowledge of how they contribute to earth's life support systems.

Well-known ecologist and entomologist E.O. Wilson (2006) wrote: "More respect is due the little things that run the world." Note that he wrote "that run the world" and not simply "with which we share the world." Most ecologists today agree that insects and other small invertebrates comprise the earth's largest total animal biomass whether

The rare and subtly beautiful Mitchell's satyr measured by weight or by volume. The total number of species is immense, probably needs sedgy fens for its survival. in the tens of millions. It is accepted that their contributions to the proper functioning of the biosphere are truly essential, yet the knowledge of precisely what they contribute and how they accomplish it is barely known or understood. It is known that through interactions between myriads of plants and animals in concert with earth's non-living components, our biosphere's life support systems attain a somewhat stable equilibrium through complexity. Ecologists also know that worldwide, species of both plants and animals are disappearing rapidly as a result of human actions. Does it matter? Probably. An often-quoted caution from ecologist Aldo Leopold (1949) is that "To keep every cog and wheel is the first precaution of intelligent tinkering."

To dramatize the insights of Iltis, Wilson, and Leopold, let's consider the fen ecosystems of northern Indiana and southern Michigan. Fens are globally rare groundwater-fed wetlands. They depend upon sensitive, complex interrelationships of mineral-rich groundwaters flowing within and through layers of gravel, peat, and marl and their associated plant communities. Never common, fens have suffered greatly from drainage for conversion to other uses. Botanically, they are sometimes referred to as

Mitchell's Satyr — continued on page 14

